

**REMARKS**

In the present Amendment, non-elected claims 1-6 are amended by adding the recitation “Ultra-Large Scale Integrated,” before the acronym “ULSI.”

Claim 5 is amended for proper antecedent basis and precision of language. Claim 5 is also amended to incorporate the subject matter of claim 6. Accordingly, claim 6 is canceled.

Independent claim 7 (of Applicants’ elected group II, claims 7-11) is amended for clarity. Specifically, the recitation “formed on the surface of the first insulating layer,” referring to the trench or via, is replaced with the recitation “formed in the first insulating layer.” Further, the recitation “above an inner surface of the at least one of trench and via,” referring to the location of the diffusion layer, is replaced with the recitation “above an inner surface of said trench or via.”

Claim 7 is also amended to replace the recitation “wherein the diffusion prevention layer is made up of a plating film” with the recitation “wherein the diffusion prevention layer comprises a plating film.” Support for this amendment may be found, for example, in the present specification at the paragraph bridging pages 14-15. Specifically, the specification teaches that silicon (Si) and/or carbon (C) are diffused into the diffusion prevention layer upon heating, *i.e.*, the diffusion prevention layer may be made of the plating films specified in Applicants’ Markush group *and* at least one of silicon and carbon. Thus, the specification supports the comprising language of the present Amendment.

Claim 7 is also amended by incorporating the subject matter of claim 8, which depends from claim 7. Accordingly, claim 8 is cancelled.

No new matter has been added, and entry of the Amendment is respectfully requested.

After entry, claims 1-7 and 9-17 will be pending.

**I. Status of the Application**

Applicants hereby affirm the telephonic election of group II, claims 7-11, drawn to ULSI wiring.

**II. Applicants' Response to the Examiner's Objections to the Specification and Claims**

*A. Response to the Objections to the Specification*

In Paragraph No. 1, the Examiner requested a substitute specification in proper idiomatic English. The Amendments to the Specification section of the present Amendment includes corrections to paragraphs on pages 1, 2, 3, 14 and 15 of the specification.

In Paragraph No. 2, the Examiner objected to the specification for allegedly failing to provide proper antecedent basis for the subject matter of present claim 8.

Applicants respectfully disagree. As noted above, the present specification discloses that after the diffusion prevention layer is formed, silicon and carbon can be diffused into the diffusion prevention layer by heating. See the paragraph bridging pages 14-15.

*B. Response to the Claim Objections*

In Paragraph No. 5 of the Action, claim 8 is objected to for informality. The Examiner requested that Applicants spell out the acronym ULSI, *i.e.*, Ultra-Large Scale Integrated. However, claim 8 and each of Applicants' elected claims 7-11 do spell out Ultra-Large Scale Integrated. On the other hand, the non-elected claims 1-6 only provide the acronym ULSI. Thus, as noted above, claims 1-6 are amended to include the recitation "Ultra-Large Scale Integrated."

In Paragraph No. 6 of the Action, claim 5 is objected to under 37 C.F.R. § 1.75(c) as allegedly being of improper dependent form. As noted above, claim 5 is amended to incorporate the subject matter of claim 6, and claim 6 is cancelled. Thus, Applicants respectfully assert that claim 5, as amended, properly depends from independent claim 1.

In Paragraph No. 7 of the Action, claim 8 is objected to under 37 C.F.R. § 1.75(c) as allegedly being of improper form. As noted above, the present specification discloses that silicon and/or carbon may diffuse into the diffusion prevention layer upon heating. Further, Applicants amended claim 7 by including the phrase “comprising.”

### **III. Applicants’ Response to the Examiner’s Claim Rejections**

#### *A. The Present Claims are Patentable over Lee*

In Paragraph No. 9 of the Action, claims 7-9 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,180,523 to Lee et al.

Applicants respectfully submit that this rejection should be withdrawn because Lee does not disclose or render obvious the ULSI wiring recited by claims 7-9.

As noted above, Applicants amended independent claim 7 by incorporating the subject matter of claim 8, which depends from claim 7. Amended claim 7 recites ULSI wiring comprising a first insulating layer, a diffusion prevention layer, a wiring layer and a second insulating layer; wherein the diffusion prevention layer comprises a plating film and at least one of silicon and carbon. The at least one of silicon and carbon diffuses into the diffusion prevention layer during a heating treatment. Lee does not teach this step.

Accordingly, the ULSI wiring recited in claim 7 is patentable over Lee, since Lee does not disclose or suggest at least the diffusion prevention layer containing at least one of silicon

and carbon. Instead, Lee simply discloses a barrier layer composed of Ni, Pd, Co, or alloys of Ni, Pd, and Co. See Lee col. 5, lines 60-62.

Claim 9 depends from independent claim 7 and is thus allowable at least by virtue of its dependency.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the § 103(a) rejection of claims 7-9 based on Lee.

*B. The Present Claims are Patentable over Lee in view of Neary and Vuillaume*

In Paragraph No. 10 of the Action, claims 8-11 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Lee in view of U.S. Patent No. 4,424,805 to Neary and the article "Organic insulating films of nanometer thickness" by Vuillaume et al. as described by U.S. Published Patent App. No. 2005/0056828 to Wada et al.

Applicants respectfully traverse. The cited references do not disclose or render obvious the ULSI wiring of the present claims.

In the present Amendment, claim 8 has been incorporated into independent claim 7, and claims 9-11 depend from claim 7. As noted above, Lee does not disclose or suggest at least the diffusion prevention layer containing at least one of silicon and carbon of present claim 7.

Further, Neary and Vuillaume do not teach or fairly suggest the diffusion prevention layer containing at least one of silicon and carbon. Thus, Neary and Vuillaume fail to cure the deficiency of Lee, and Applicants assert that the present claims are patentable over the cited references.

Applicants further assert that claims 9-11 are patentable over the cited references for the following additional independent reasons.

Applicants point out that there would be no motivation to combine Lee with Neary. Neary relates to "a solar energy system wherein chemical A is converted into chemical B in the presence of a photo-sensitizer with the absorption of considerable heat, which heat can be redelivered at will by placing chemical B in contact with a catalyst." See Neary's Abstract. Thus, Applicants assert that a person having skill in the art would not be motivated to combine the ULSI wiring of Lee with the solar energy system teachings of Neary to arrive at present claims 9-11.

Furthermore, Applicants point out that Vuillaume does not teach or suggest the adhesive layer that is a monomolecular layer containing an amino group of present claim 11. Vuillaume simply discloses that monolayers of organic molecules form high performance electrically insulating barriers. The Examiner failed to point out where Vuillaume teaches or suggests that organic monolayers may function as an adhesive layer.

For these reasons, the Examiner is respectfully requested to reconsider and withdraw the § 103 rejection of claims 8-11 based on Lee in view of Neary and Vuillaume.

#### **IV. Conclusion**

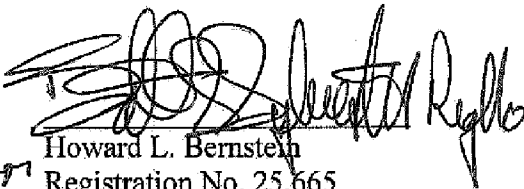
Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Amendment Under 37 C.F.R. § 1.111  
U.S. Appln. No.: 10/694,172

Attorney Docket No.: Q78176

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

  
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CUSTOMER NUMBER

Date: February 27, 2007